

IN THE CLAIMS:

1. A flash memory device comprising:  
an array of non-volatile memory cells;  
a clock signal connection to receive a clock signal comprising clock cycles;  
a rambus dynamic random access memory (RDRAM) interconnect configuration coupled to the array of non-volatile memory cells, the interconnect configuration comprising a multiplexed row address bus, a multiplexed column address bus, and data connections; and  
command logic coupled to the array to provide two data access operations per clock cycle.
2. The flash memory device of claim 1 wherein the array of non-volatile memory cells is arranged in a plurality of addressable banks.
3. The flash memory device of claim 2 wherein each addressable bank contains addressable sectors of memory cells.
4. The flash memory device of claim 1 wherein the data connections are burst oriented and the control circuitry comprises means for starting data access at a selected location and continuing for a programmed number of locations in a programmed sequence
5. The flash memory device of claim 1 wherein the command logic includes control registers used to store data for memory operation control.
6. The flash memory device of claim 1 and further including sense amplifier circuitry coupled to the memory cells over bit lines, wherein the sense amplifier circuitry detects a differential voltage between the bit lines.

7. The flash memory device of claim 1 and further including pre-charge circuitry coupled to pre-charge the bit lines to first and second voltage levels to provide an initial differential voltage prior to sensing a memory cell.
6. The flash memory of claim 7 wherein the pre-charge circuitry pre-charges an active digit line that is coupled to a read memory cell to a voltage that is greater than a complementary digit line.
8. The flash memory of claim 7 wherein the pre-charge circuitry pre-charges the digit lines to a differential level using charge sharing.
9. The flash memory of claim 7 wherein the pre-charge circuitry pre-charges the digit lines to a differential level using a bias circuit.
10. A processing system comprising:
  - a processor; and
  - a rambus dynamic random access memory compatible flash memory device coupled to the processor, the memory device comprising:
    - an array of non-volatile memory cells;
    - a clock signal connection to receive a clock signal comprising clock cycles;
    - a rambus dynamic random access memory interconnect configuration coupled to the array of non-volatile memory cells, the interconnect configuration comprising a multiplexed row address bus, a multiplexed column address bus, and data connections that are burst oriented; and
    - command logic coupled to the array to provide two data access operations per clock cycle starting at a selected location and continuing for a programmed number of locations in a programmed sequence.

11. The system of claim 10 wherein the processor generates flash memory compatible control signals.
12. The system of claim 10 and further including pre-charge circuitry coupled to pre-charge the bit lines to first and second voltage levels to provide an initial differential voltage prior to sensing a memory cell.
13. The system of claim 10 wherein the processor is adapted to receive burst transmissions of data from the memory device.
14. The system of claim 10 wherein the non-volatile memory device is a flash memory device.
15. A processing system comprising:  
a processor;  
a single communication bus coupled to the processor;  
a volatile memory device coupled to the single communication bus; and  
a rambus dynamic random access memory (RDRAM) compatible flash memory device coupled to the single communication bus, the memory device comprising:  
an array of non-volatile memory cells;  
a clock signal connection to receive a clock signal comprising clock cycles; and  
command logic coupled to the array to provide two data access operations per clock cycle following an RDRAM compatible format and starting at a selected location and continuing for a programmed number of locations in a programmed sequence.
16. The processing system of claim 15 wherein the volatile memory device and the RDRAM compatible flash memory device both respond to common command signals provided on the single communication bus.

17. The processing system of claim 15 and further including:
  - sense amplifier circuitry coupled to the memory cells over bit lines, wherein the sense amplifier circuitry detects a differential voltage between the bit lines; and
  - pre-charge circuitry coupled to pre-charge the bit lines to first and second voltage levels to provide an initial differential voltage prior to sensing a memory cell.
18. The processing system of claim 15 wherein the two data access operations per clock cycle are performed on clock transitions.
19. The processing system of claim 15 wherein the memory cells are floating gate memory cells.
20. The processing system of claim 15 wherein the processor generates computer system commands.